

CLAIMS

- 1 A laser shock peening process in which a laser beam is fired at a surface of a workpiece to generate a plurality of laser shock peened spots on the workpiece, at least one of the laser shock peened spots having a shape different from that of others of the laser shock peened spots.
- 2 A laser shock peening process as claimed in claim 1, in which a shape defining device is disposed in the path of the laser beam in order to achieve the different shape.
- 3 A laser shock peening process as claimed in claim 2, in which the shape defining device is moved into and out of the path of the laser beam to change the shape of the spots.
- 4 A laser shock peening process as claimed in claim 2, in which the geometry of the shape defining device is changed to change the shape of the spots.
- 5 A laser shock peening process as claimed in claim 2, in which a further shape defining device is provided in the path of the laser beam for creating the shape of the said others of the laser shock peened spots.
- 6 A laser shock peening process as claimed in any one of the preceding claims, in which the laser shock peened spots are generated so as to cover substantially the full extent of a treated area, the laser shock peened spots predominantly having a first shape, with at least one of the laser shock peened spots in the perimeter region of the treated area having a second shape different from the first shape.
- 7 A laser shock peening process as claimed in claim 6, in which the first shape is rectangular.

- 8 A laser shock peening process as claimed in claim 1 and substantially as described herein.
- 9 Laser shock peening apparatus comprising a laser and a selectively operable device for changing the shape of a spot generated by the laser beam on a workpiece during a laser shock peening operation.
- 10 Laser shock peening apparatus as claimed in claim 9, in which the selectively operable means comprises a mask which is selectively movable into and out of the path of the laser beam.
- 11 Laser shock peening apparatus as claimed in claim 10, in which the mask is one of a plurality of different masks for generating respective differently shaped spots.
- 12 Laser shock peening apparatus as claimed in claim 10, in which the mask is provided with a plurality of different shaped apertures for generating respectively differently shaped spots, the mask being indexable to present a selected one of the apertures in the path of the laser beam.
- 13 Laser shock peening apparatus as claimed in claim 9, in which the selectively operable device comprises a variable-geometry aperture device.
- 14 Laser shock peening apparatus substantially as described herein with reference to, and as shown in, the accompanying drawings.
- 15 A component having a laser shock peened surface region comprising a plurality of laser shock peened spots, at least one of the laser shock peened spots having a shape different from that of others of the shock peened spots.

- 16 A component as claimed in claim 15, in which the laser shock peened surface region comprises laser shocked peened spots predominantly of a first shape, at least one laser shock peened spot at a perimeter region of the surface region having a second shape.
- 17 A component as claimed in claim 16, in which the perimeter region comprises the edge of a hole in the surface of the component.
- 18 A component as claimed in claim 16, in which the perimeter region is adjacent an edge of the component.
- 19 A component having a laser shock peened surface substantially as described herein with reference to the accompanying drawings.